REMARKS/ARGUMENTS

This reply is responsive to an office action mailed on September 5, 2006. Reconsideration and allowance of the application and presently pending claims 1-13 are respectfully requested.

Present Status of the Patent Application

Claims 1-13 remain pending in the present application. Claims 1, 4, and 7 have been amended. The amendments to the claims were made to render them more clear and definite and to emphasize the patentable novelty thereof. There is no intent to surrender equivalence. No new search should be required.

Response to Claim Rejections Under 35 U.S.C. §112

Claims 1-13 have been rejected under 35 U.S.C. 112, first paragraph, as allegedly failing to comply with the written description requirement. Applicants have amended claims 1, 4, and 7 to overcome this rejection. The "optimal consumer clusters sets" have "a plurality of consumer clusters" as provided by the specification and stated by the Office Action. Furthermore, each consumer may be included in only one of the consumer clusters of the optimal consumer cluster set, because as stated by the Office Action the specification states that they must have "different behavioral or demographic characteristics from consumers in all other clusters." The same consumer in two different consumer clusters would not satisfy this condition. The claims have been amended to comply with the written description requirement, and this rejection should be withdrawn.

Response to Claim Rejections Under 35 U.S.C. §102

Claims 1, 4, and 7-12 have been rejected under 35 U.S.C. 102 as allegedly being anticipated by Lazarus et al. (U.S. Patent No. 6,430,539). Applicants respectfully traverse this rejection.

For a proper rejection of a claim under 35 U.S.C. §102(b), the cited reference must disclose all elements/features/steps of the claim. See, e.g., *E.I. du Pont Nemours & Co. v. Phillips Petroleum Co.*, 849 F.2d 1430, 7 USPQ2d 1129 (Fed. Cir. 1988).

The Lazarus patent discloses a predictive modeling to cluster merchant vectors representing specific merchants to form merchant segments. Consumer spending habits are used in selected past time periods to predict spending patterns in subsequent time periods. Thus, the behavior (spending habits) of consumers is used to create merchant segments or clusters, to predict future spending in that cluster of merchants.

Once the merchant cluster is identified, then the demographics of the consumers whose spending habits were considered in creating the cluster in the first place, may then be used "to describe the most frequent or average demographic features ... of the consumers." (col. 9, line 65 – col. 10, line 1). In short, behavior (spending habits) is used to form merchant clusters. Thereafter, once the clusters are created, demographics are used to describe the consumers in the cluster. This is a two step process, and the demographic characteristics are not used to generate the cluster.

Independent Claim 1

Independent claim 1, as amended, is allowable for at least the reason that Lazarus does not disclose, teach, or suggest any of the following:

1) "generating a plurality of classification trees based on behavioral and demographic data for a set of consumers,"

2) "each of said classification trees producing a consumer cluster set having a plurality of consumer clusters,"

3) "searching said consumer clusters sets for an optimal consumer cluster set that optimizes a measure of the behavioral and demographic data,"

4) "each consumer in the set of consumers is included in only one of the consumer clusters in the optimal consumer cluster set," or

5) "consumers in each consumer cluster of said plurality of consumer clusters in the optimal consumer cluster set have substantially similar behavioral and demographic characteristics to each other and different behavioral or demographic characteristics from consumers in all other consumer clusters of said plurality of consumer clusters in the optimal consumer cluster set."

In this regard, and with reference to the teaching of the Lazarus patent, the Office Action has cited col. 1, lines 35-47; col. 2., lines 23-30; col. 3, lines 1-25 and lines 55-57; col. 4, lines 12-42; col. 5, lines 28-31, col. 9, line 55 through col. 10, line 12; col. 10, lines 22-28; col. 11, lines 46-66; col. 12, lines 57-62; col. 14, lines 44-51; col. 14, line 64 through col. 15, line 7; and col. 28, lines 12-17 as follows:

> ... The ultimate goal of this type of approach, whether acknowledged or not, is to predict consumer spending in the future. The assumption is that consumers will spend money on their interests, as expressed by things like their subscription lists and their demographics. Yet, the data on which the determination of interests is made is typically only indirectly related to the actual spending patterns of the consumer. For example, most publications have developed demographic models of their readership, and offer their subscription lists for sale to others interested in the particular

demographics of the publication's readers. But subscription to a particular publication is a relatively poor indicator of what the consumer's spending patterns will be in the future.
(col. 1, lines 35-47)

Accordingly, what is needed is the ability to model consumer financial behavior based on actual historical spending patterns that reflect the time-related nature of each consumer's purchase. Further, it is desirable to extract meaningful classifications of merchants based on the actual spending patterns, and from the combination of these, predict future spending of an individual consumer in specific, meaningful merchant groupings.
(col. 2, lines 23-30)

... system and method of analyzing and predicting consumer financial behavior that uses historical, and time-sensitive, spending patterns of individual consumers to create both meaningful ***groupings (segments) of merchants*** which accurately reflect underlying consumer interests, and a predictive model of consumer spending patterns for each of the ***merchant segment***. Current spending data of an individual consumer or groups of consumers can then be applied to the predictive models to predict future spending of the consumers in each of the ***merchant clusters***.

In one aspect, the present invention includes the creation of data-driven grouping of merchants, based essentially on the actual spending patterns of a group of consumers. Spending data of each consumer is obtained, which describes the spending patterns of the consumers in a time-related fashion. For example, credit card data demonstrates not merely the merchants and amounts spent, but also the sequence in which purchases were made. One of the features of the invention is its ability to use the co-occurrence of purchases at different merchants to group merchants into meaningful ***merchant segments***. That is, merchants which are frequently shopped at within some number of transactions or time period of each other reflect a meaningful cluster. This data-driven clustering of merchants more accurately describes the interests or preferences of consumers.
(col. 3, lines 1-25)

Preferably, each consumer is also given a profile that includes various demographic data, and summary data on spending habits. ...
(col. 3, lines 55-57)

Given the ***merchant segments***, the present invention then creates a predictive model of future spending in each ***merchant segment***, based on transaction statistics of historical spending in the ***merchant segment*** by those consumers who have purchased from merchants in the segments, in other segments, and data on overall purchases. In one embodiment, each predictive model predicts spending in a ***merchant cluster*** in a predicted time interval, such as 3 months, based on historical spending in the cluster in a prior time interval, such as the previous 6 months. During model training, the historical transactions in the merchant cluster for consumers who spent in the cluster, is summarized in each consumer's profile in summary statistics, and input into the predictive model along with actual spending in a predicted time interval. Validation of the predicted spending with actual spending is used to confirm model performance. The predictive models may be a neural networks, or other multivariate statistical model.

This modeling approach is advantageous for two reasons. First, the predictive models are specific to ***merchant clusters*** that actually appear in the underlying spending data, instead of for arbitrary classifications of merchants such as SIC classes. Second, because the consumer spending data of those consumers who actually purchased at the merchants in the ***merchant clusters*** is used, they most accurately reflect how these consumer have spent and will spend at these merchants.

To predict financial behavior, the consumer profile of a consumer, using preferably the same type of summary statistics for a recent, past time period, is input into the predictive models for the different ***merchant clusters***. The result is a prediction of the amount of money that the ... (col. 4, lines 11-42)

... The underlying intuition here is that merchants whom the consumers' behaviors indicates as being related will occur together often, whereas unrelated merchants do not occur together often. ... (col. 5, lines 26-65)

Major categories 202 describe how the customers in a ***merchant segment*** typically use their accounts. Uses include retail purchases, direct marketing purchases, and where this type cannot be determined, then other major categories, such as travel uses, educational uses, services, and the like. Minor categories 204 describe both a subtype of the major category (e.g. subscriptions being a subtype of direct marketing) or the products or services purchased in the transactions (e.g. housewares, sporting goods, furniture) commonly purchased in the segment. Demographics information 206 uses account data from the consumers who frequent this segment to describe the most frequent or

average demographic features, such as age range or gender, of the consumers. Geographic information 208 uses the account data to describe the most common geographic location of transactions in the segment. In each portion of the segment description 210 one or more descriptors may be used (i.e. multiple major, minor, demographic, or geographic descriptors). This naming convention is much more powerful and fine-grained than conventional SIC classifications, and provides insights into not just the industries of different merchants (as in SIC) but more importantly, into the geographic, approximate age or gender, and lifestyle choices of consumers in each segment.

The various types of segment reports are further described in section I. Reporting Engine, below.
(col. 9, line 55 through col. 10. line 12)

... System 400 operates on different types of data as inputs, including consumer summary file 404 and consumer transaction file 406, generates interim models and data, including the consumer profiles in profile database 414, merchant vectors 416, merchant segment predictive models 418, and produces various useful outputs including various segment reports 428-432.
(col. 10. lines 22-28)

Using the updated account profiles, this data is input into the set of predictive models to generate 310 for each consumer, an amount of predicted spending in each ***merchant segment*** in a desired prediction time period. For example, the predictive models may be trained on a six month input window to predict spending in a subsequent three month prediction window. The predicted period may be an actual future period or a current (e.g. recently ended) period for which actual spending is available.

The predicted spending levels and consumer profiles allow for various levels and types of account and segment analysis 312. First, each account may be analyzed to determine which segment (or segments) the account is a member of, based on various membership functions. A preferred membership function is the predicted spending value, so that each consumer is a member of the segment for which they have the highest predicted spending. Other measures of association between accounts and segments may be based on percentile rankings of each consumer's predicted spending across the various merchant segments. ...
(col. 11, lines 46-66)

... The customer or the financial institution may supply the additional demographic fields which are deemed to be of informational or of predictive value. Examples of demographic fields include age, gender and income; other demographic fields may be provided, as desired by the financial institution.
(col. 12, lines 57-62)

... The master file is generated as a preprocessing step before inputting data to the profiling engine 412. The master file 408 is essentially the customer summary file 404 with the consumer's transactions appended to the end of each consumer's account record. Hence the master file has variable length records. The master files 408 are preferably stored in a database format allowing for SQL querying. There is one record per account identifier.
(col. 14, lines 44-51)

Referring to FIG. 4b, the predictive model generation system 440 takes as its inputs the master file 408 and creates the consumer profiles and consumer vectors, the merchant vectors and ***merchant segments***, and the segment predictive models. This data is used by the profiling engine to generate predictions of future spending by a consumer in each ***merchant segment*** using inputs from the data postprocessing module 410.

FIG. 5 illustrates one embodiment of the predictive model generation system 440 that includes three modules: a merchant vector generation module 510, a clustering module 520, and a predictive model generation module 530.
(col. 15, line 64 through col. 16, line 7)

However computed, the consumer vectors can then be clustered, so that similar consumers, based on their purchasing behavior, form a ***merchant segment***. This defines a merchant segment vector. The merchant vectors which are closest to a particular merchant segment vector are deemed to be included in the ***merchant segment***.
(col. 28, lines 12-17)
(emphasis added)

1) "generating a plurality of classification trees based on behavioral and demographic data for a set of consumers"

As can be verified from a review of these cited portions of Lazarus, there is no teaching or disclosure of "generating a plurality of classification trees based on behavioral and demographic data for a set of consumers." In fact in the prior Office Actions, the Examiner agreed with this statement by stating that "Lazarus does not explicitly disclose" this element. However, the current Office Action states under section 6 the following:

> ... Lazarus discloses "generating a plurality of classification trees based on behavioral and demographic data for a set of consumers, each of said classification trees producing a consumer cluster set" creating a predictive model of future spending in each ***merchant segment*** based on transaction statistics of **historical spending** in the ***merchant segment*** (group) by those consumers who have purchased from merchants in the segments (col. 3, lines 5-25; col. 4, lines 12-37[]) and the ability to model consumer financial behavior based on ***actual historical spending patterns*** that reflect the time-related nature of each consumer's purchase (col. 2, lines 23-30). Applicant should duly note that the term of classification refers to the problem of predicting the number of sets to which an item belongs by building a model based on some predictor variables.
> ***(emphasis added)***

A careful review of the above section of the Office Action and the inserted cited references to Lazarus does **not** reveal any disclosure of generating even one classification tree in Lazarus. The Lazarus patent discloses (and this is further re-enforced in the Office Action) creating **merchant segments** based on **consumer transactions**, not classification trees based on behavioral and demographic data. Furthermore, Lazarus does not disclose generating anything based on behavioral and demographic data.

Also, there is no mention, nor suggestion, in Lazarus of sets of clusters. Only the creation of merchant clusters, not sets of clusters, are taught by Lazarus.

The only use of demographic data in Lazarus appears to be to describe the average consumer of a merchant segment cluster, and not to generate the merchant segment cluster itself. The demographic data is used only after the merchant segment/ cluster has been identified.

In the last sentence of the above section, the Examiner appears to be attempting to define the term "classification" in a very specific and expansive manner to describe the method of the Lazarus patent. Firstly, the undersigned is unable to find the use of the word "classification" or the like terminology in the Lazarus patent. Secondly, assuming for the moment that such terminology may be found in Lazarus, according to the Merriam-Webster Online Dictionary, the term "classification" means "the act or process of classifying" or "a systematic arrangement in groups or categories according to established criteria." Nothing in the Lazarus patent indicates that the term "classification" should mean any more than the dictionary definition. However, even using the Examiner's definition, the present invention, as claimed, does **not** predict the number of sets (consumer cluster sets) to which at item (consumer) belongs by building a model (classification tree?) based on some predictor variables. Contrary to this definition by the Examiner, it is respectfully contended that Lazarus does not teach, nor suggest, "sets", nor "classification trees."

Therefore, Lazarus does not disclose "generating a plurality of classification trees based on behavioral and demographic data for a set of consumers."

2) "each of said classification trees producing a consumer cluster set having a plurality of consumer clusters"

As can be verified from a review of these cited portions of Lazarus, there is no teaching or disclosure of "each of said classification trees producing a consumer cluster set having a plurality of consumer clusters." As discussed above, Lazarus does **not** disclose classification trees. Lazarus does **not** teach or suggest "sets" or even a "consumer cluster set". Lazarus does disclose merchant (**not** consumer) segments or clusters, but does **not** even disclose having multiple sets of merchant clusters. In addition, Lazarus produces merchant clusters by analyzing consumer spending transactions (behavior) only, **not** using classification trees. In short, Lazarus does not suggest or teach a multiplicity of classification trees, where "each of said classification trees producing a consumer cluster set." Lazarus does not use even a single tree, and does not teach "a consumer cluster set." Therefore, Lazarus does not disclose "each of said classification trees producing a consumer cluster set having a plurality of consumer clusters."

3) "searching said consumer clusters sets for an optimal consumer cluster set that optimizes a measure of the behavioral and demographic data"

As can be verified from a review of these cited portions of Lazarus, there is no teaching or disclosure of "searching said consumer clusters sets for an optimal consumer cluster set that optimizes a measure of the behavioral and demographic data." This element was only addressed in the Office Action by reference to two sections of the Lazarus patent (col. 11, lines 56-65 and col. 14, lines 44-51). These sections only discuss analyzing consumer accounts to determine their membership in which segments, and to describe what information is included in each consumer's record. The Applicant respectfully submits that these sections of Lazarus do **not** even remotely disclose this element of the present application. As discussed previously,

Lazarus deals with merchant clusters or segments, and does **not** teach "sets" nor an "optimal" set. The merchant clusters of Lazarus are created using the behavioral data (the spending habits) of consumers, and **no** demographic data is used to create the merchant clusters. The demographic data of the consumers in each merchant cluster is merely utilized to describe the consumers in that particular merchant cluster, and **not** to create the merchant cluster itself. Therefore, Lazarus does not disclose "searching said consumer clusters sets for an optimal consumer cluster set that optimizes a measure of the behavioral and demographic data."

4) "each consumer in the set of consumers is included in only one of the consumer clusters in the optimal consumer cluster set"

As can be verified from a review of the cited portions of Lazarus reproduced above, there is no teaching or disclosure of "each consumer in the set of consumers is included in only one of the consumer clusters in the optimal consumer cluster set." In fact, Lazarus **teaches away** from even a consumer account belonging to only one merchant segment by stating "each account may be analyzed to determine which segment (**or segments**) the account is a member of" (col. 11, lines 58-60, emphasis added). Lazarus explicitly states that a consumer account may well belong to more than one segment. Therefore, Lazarus does not disclose "each consumer in the set of consumers is included in only one of the consumer clusters in the optimal consumer cluster set."

5) "consumers in each consumer cluster of said plurality of consumer clusters in the optimal consumer cluster set have substantially similar behavioral and demographic characteristics to each other and different behavioral or demographic characteristics from consumers in all other consumer clusters of said plurality of consumer clusters in the optimal consumer cluster set"

As can be verified from a review of these cited portions of Lazarus, there is no teaching or disclosure of "consumers in each consumer cluster of said plurality of consumer clusters in the optimal consumer cluster set have substantially similar behavioral and demographic characteristics to each other." Also, there is no suggestion of "different behavioral or demographic characteristics from consumers in all other consumer clusters of said plurality of consumer clusters in the optimal consumer cluster set." As stated clearly above, Lazarus merely discloses merchant clusters or merchant segments and using prior consumer spending habits to form the merchant clusters/segments. In fact at col. 4, line 30, Lazarus **teaches away** from consumer clusters by stating "the predictive models are specific to merchant clusters."

Regarding the use of consumer information, Lazarus discloses at col. 3, lines 1-6 a "system and method of analyzing and predicting consumer financial behavior that uses historical, and time-sensitive, spending patterns of individual consumers to create both meaningful groupings (segments) of merchants ... and a predictive model of consumer spending patterns for each of the merchant segment." On the other hand, Applicants do **not** predict consumer spending patterns for each merchant segment, but instead Applicants classify consumers in clusters.

Regarding consumers in one cluster having different characteristics from the consumers in the other clusters, Lazarus as discussed above teaches that a consumer account can belong to more than one segment. Thus, the characteristics of that consumer account would be the same in more than one segment or cluster. Thus, Lazarus **teaches away** from "consumers in each consumer cluster of said plurality of consumer clusters in the optimal consumer cluster set have ... different behavioral or demographic characteristics from consumers in all other consumer clusters of said plurality of consumer clusters in the optimal consumer cluster set."

Furthermore, Lazarus discloses at col. 4, lines 38-41 "the consumer profile of a consumer ... is input into the predictive models for the different merchant clusters." The consumer profiles are **not** arranged into consumer clusters having similar characteristics, but are used to create **merchant clusters** of related merchants according to the consumers' spending habits. Therefore, Lazarus does not disclose "consumers in each consumer cluster of said plurality of consumer clusters in the optimal consumer cluster set have substantially similar behavioral and demographic characteristics to each other and different behavioral or demographic characteristics from consumers in all other consumer clusters of said plurality of consumer clusters in the optimal consumer cluster set."

As summarized in the table on the next page, claim 1 of the present application is patentable over the Lazarus patent for at least the ten listed shortcomings. The Lazarus patent does not disclose, teach, or suggest "generating a plurality of classification trees" (or classification trees at all), a plurality of (or even one) consumer cluster sets (or any sets for that matter), "consumer clusters," using demographic as well as behavioral data to determine the sets, "searching said consumer cluster sets", an "optimal consumer cluster set", and others.

To summarize at least some of these differences, the following is a table:

Present Application Claim 1	Lazarus
"generating a plurality of classification trees based on behavioral and demographic data for a set of consumers"	- no classification trees, only merchant and/or consumer vectors - not based on behavioral and demographic data, only based on transactional data or spending habits (behavioral data only)
"each of said classification trees producing a consumer cluster set having a plurality of consumer clusters"	- no consumer cluster sets or consumer clusters, only merchant segments or clusters are generated from the vectors

Present Application Claim 1 (cont.)	Lazarus (cont.)
"searching said consumer cluster sets for an optimal consumer cluster set that optimizes a measure of the behavioral and demographic data"	- no searching the consumer cluster sets, only analyzing individual consumer accounts - no teaching or suggestion of an optimal consumer cluster set or anything remotely comparable to it - no optimizing on a measure of the behavioral and demographic data, only transactional data (behavioral data) is used in analyzing individual consumer accounts to determine where the consumer shops
"each consumer in the set of consumers is included in only one of the consumer clusters in the optimal consumer cluster set"	- teaches away since consumer accounts can be included in more than one merchant segment or cluster as disclosed at col. 11, lines 58-60
"consumers in each consumer cluster of said plurality of consumer clusters in the optimal consumer cluster set have substantially similar behavioral and demographic characteristics to each other and different behavioral or demographic characteristics from consumers in all other consumers clusters of said plurality of consumer clusters in the optimal consumer cluster set"	- no optimal consumer clusters, only merchant segment/clusters - no substantially similar behavioral and demographic characteristics, only similar spending habits (behavioral characteristics) - no different behavioral or demographic characteristics, since the same consumer account may be in multiple merchant segments/clusters. The characteristics for the consumer would be identical between the two merchant segments/clusters.

Accordingly, the rejection is deficient in these areas. Notwithstanding, the undersigned has reviewed the entirety of the Lazarus patent and has failed to identify any such teachings anywhere within this reference. Accordingly, the Lazarus patent fails to teach or disclose the invention as defined by claim 1, and the rejection of claim 1 should be withdrawn.

Independent Claim 4

Independent claim 4, as amended, is allowable for at least the same reasons as described above regarding claim 1. Accordingly, the Lazarus patent fails to teach or disclose the invention as defined by claim 4, and the rejection of claim 4 should be withdrawn.

Independent Claim 7

Independent claim 7, as amended, is allowable for at least the same reasons as described above regarding claim 1. Accordingly, the Lazarus patent and Zhang article fail to teach or disclose the invention as defined by claim 7, and the rejection of claim 7 should be withdrawn.

Dependent Claims

Dependent claims 8-12 are believed to be allowable for at least the reason that these claims depend from allowable independent claim 7. *In re Fine,* 837 F.2d 1071, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988).

Therefore, claims 1, 4, 7-12 patentably distinguish over Lazarus.

Response to Claim Rejections Under 35 U.S.C. §103

Claims 2, 3, 5, 6, and 13 have been rejected under 35 U.S.C. 102 as allegedly being unpatentable over Lazarus in view of Zhang article entitled "Classification Trees." Dependent claims 2 and 3, 5 and 6, and 13 are believed to be allowable for at least the reason that these claims depend from allowable independent claims 1, 4, and 7, respectively. *In re Fine,* 837 F.2d 1071, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988).

CONCLUSION

The other cited art of record has been reviewed, and it is believed that the claims, as amended, patentably distinguish thereover.

In light of the foregoing amendments and for at least the reasons set forth above, Applicant respectfully submits that all objections and rejections have been traversed, rendered moot, and/or accommodated, and that now pending claims 1-13 are in condition for allowance. Favorable reconsideration and allowance of the present application and all pending claims are hereby courteously requested. If, in the opinion of the Examiner, a telephonic conference would expedite the examination of this matter, the Examiner is invited to call the undersigned at 619-231-3666.

Please direct all correspondence to the undersigned attorney or agent at the address indicated below.

Respectfully submitted,

Date: September 20, 2006

By: _____

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